

Minors Offered by the Mellon College of Science

The Mellon College of Science offers several minors to students interested in broadening their scientific training or acquiring a level of expertise in a particular scientific field. The intercollege minors described below are designed to supplement your degree in science; the departmental minors offer you a means of exploring another field and are open to students throughout the university.

Intercollege Minors

Please see the descriptions below.

- Environmental Science
- Health Care Policy and Management
- Scientific Computing

Departmental Minors in the Mellon College of Science

For descriptions, please see the departmental sections which follow.

- Biological Sciences
- Chemistry
- Computational Finance
- Discrete Mathematics and Logic
- Mathematical Sciences
- Neuroscience
- Physics

Minor in Environmental and Sustainability Studies

Program Director: Maggie Braun, MCS Dean's Office
Faculty Advisor: Abigail Owen, History Department

This new minor replaces the earlier minors in Environmental Science (MCS), Environmental Studies (Dietrich), and Environmental Engineering & Sustainability (Engineering).

Required Courses:

One Course in Chemistry

Choose one		Units
09-105	Introduction to Modern Chemistry I	10
09-107	Honors Chemistry: Fundamentals, Concepts and Applications (for students enrolled in MCS, Engineering, or SCS)	10
09-103	Atoms, Molecules and Chemical Change (for students enrolled in CFA, Tepper, or Dietrich)	9

Interdisciplinary Course

99-236	Introduction to Environmental Ideas	9
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One Course in Statistics & Data Science (CFA Students only)

Choose one		Units
36-200	Reasoning with Data Students entering CMU prior to 2018 may substitute 36-201 for 36-200.	9

Electives (36 Units)

Appropriate electives chosen in consultation with the Faculty Advisor.

Total Number of Required Units **54**

Minor in Health Care Policy and Management

Sponsored by:
Heinz College of Information Systems and Public Policy
Dietrich College of Humanities and Social Sciences

Mellon College of Science

Faculty Advisors:

Jason D'Antonio, Mellon College of Science
James F. Jordan, H. John Heinz III College

The face of health care is changing. The practice of medicine is being fundamentally altered by the forces of change in public policy, health care organizations and in the industry as a whole. The role of individual professionals in this industry is changing as rapidly as the industry itself. Traditional career paths have disappeared overnight to be replaced by new opportunities that require new skills. New organizations are placing new demands on their professional and medical staffs. The criteria of efficiency and financial stability are entering the domains of diagnosis and treatment.

This minor is designed to provide students considering a career in the health professions with an understanding of how these changes are likely to affect their careers. Students will become familiar with the critical policy and management issues and will begin to learn to operate effectively in the emerging health care environment. The curriculum combines economic, organizational, managerial, historical and psychological perspectives on these issues to provide a foundation for a deepened understanding of the changing structure of health care organizations and policy.

Required Courses for HCPM Minor (45 Unit minimum)

A total of 69 units are required to complete this minor. Entry into the minor requires completion of 73-102 Principles of Microeconomics and 88-221 Analytical Foundations of Public Policy or the equivalent by approval.

Required Courses

Students are required to take the following courses.

79-330	Medicine and Society	9
94-705	Health Economics	12
90-836	Health Policy and Management Systems	6

Elective Courses

24 units

Complete a minimum of 24 units.

Heinz College Courses

90-721	Healthcare Management	6
90-818	Health Care Quality & Performance Improvement	6
90-723	Financial Statements and Analysis of Companies	6
90-831	Advanced Financial Management of Health Care	6
94-706	Healthcare Information Systems	12
90-832	Health Law	6

Humanities and Social Sciences Courses (9 units each)

76-494	Healthcare Communications	9
79-318	Sustainable Social Change: History and Practice	9
80-245	Medical Ethics	9
85-241	Social Psychology	9
85-442	Health Psychology	9
85-446	Psychology of Gender	9

Please note that some of these courses have prerequisites that will not count toward the completion of the requirements for this minor.

Minor in Scientific Computing

Advisor: Dr. Maggie Braun

Sometimes called "computational science," scientific computing is the application of high-performance computers and modern computational technologies to problems in the sciences and engineering. Research in this area is inherently multidisciplinary, requiring strong ties with a scientific discipline.

MCS students can easily build on their scientific training with this applied computational program. The curriculum consists of five areas of concentration, which span the natural sciences, mathematics, programming, and research. The curriculum is structured to allow flexibility in choosing courses that meet students' particular interests or best compliment their major. The minor is also a natural choice for students majoring in any technical area.

Required Courses

Students must meet the requirements of the following categories:

A. Non-Introductory Science Requirement (9-12 units)

Complete 1 course from Biological Sciences, Chemistry, or Physics at the 200 level or higher, excluding those courses listed below as part of the requirements of the minor. Courses with a significant science component from other colleges may be substituted with approval from the minor advisor.

B. Computational Science Requirement (18-24 units)

Complete 2 of the following courses:

03-250	Introduction to Computational Biology	12
03-511	Computational Molecular Biology and Genomics	9
09-560	Computational Chemistry	12
15-386	Neural Computation	9
33-241	Introduction to Computational Physics	9

C. Computational Methods Requirement (9 units)

Complete one of the following courses from outside of your home department.

21-320	Symbolic Programming Methods	9
21-369	Numerical Methods	12
33-232	Mathematical Methods of Physics	10
33-456	Advanced Computational Physics	9
36-410	Introduction to Probability Modeling	9

D. Applied Scientific Computing Research Project(s) (9 units)

Complete one approved research project in an area of applied scientific computing. In some cases, this research could be replaced with 9 units of an approved project-based course in advanced scientific computing. The administrator of the minor will maintain a list of appropriate courses. Under special circumstances summer research may count toward this requirement, although it cannot be counted toward the units required for graduation.

E. Complete any additional course from category C or D (9 units)